UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/916,541	07/27/2001	Carl D. Meinhart	1279-368	8568

7590 12/02/2003

Terri L. Sale, Esq.
Fulbright & Jaworski LLP
865 South Figueroa Street, 28th Floor
Los Angeles, CA 90017

EXAMINER	
CHEU, CHANGHWA J	

ART UNIT	PAPER NUMBER
1641	11

DATE MAILED: 12/02/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/916,541	MEINHART ET AL.	
	Examiner	Art Unit	
	Jacob Cheu	1641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-24* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-9, 16-20, 22-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to claim 1, step (b), " a sample chamber' is vague and confusing. The recited apparatus is actually an concave without side walls to hold sample. (See Figure 4 and 5) It is not a "chamber" in the art.

With respect to claim 1, step (b), "having an inlet for receiving a fluid and an outlet for discharging effluent" is vague and indefinite. It is unclear where the said sample chamber having outlet and inlet component. It is not shown in any of the illustrated figures from the specification. It is believed that the inlet and outlet components are in the microfluidic chip recited in the claim 10, step (b).

With respect to claim 22, line 5, "field material-," is vague and confusing. It is suggested that applicant deletes the symbol '-" for clarity.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claim 1, 2, 4-24 under 35 U.S.C. 103(a) as being unpatentable over Lading et al. (WO 99/37996) in view of Beregovski et al.. (Sensors and Actuators 1998 53: 116-124)

Lading et al. disclose a sensor chip device in detecting analytes of interets. The sensor chip comprises a pair of lasers comprising a reference laser (7) and a sensor laser (7'), with gain region (12), mirrors (11), sample cavity (8, 8') having an inlet for receiving a fluid and an outlet for discharging effluent from a microfluidic system (13) and exposing to the evanescent field of laser sensor, heterodyne detector (4) at the juncture of the reference and sensor coherent light output sections, for detection the change of refractive index of fluid in the sample chamber. (See Figure 2-4) Lading et al. also teach loading the surface of sensing sensor with a specific binding partner as an adsorbent for molecules to be diagnosed (claims 12-14), the microfluidics system (13) for passing a sample to the waveguides (Figure 2). The sample cavity is separate and physically spaced from the gain and mirror regions. (See components 7 and 8 in Figure 2 and sections 14a-14b as sample cavities versus component 12 gain region in Figure 3) However, Lading et al. do not specifically disclose placing a phase section in its sensor laser. Beregovski et al. teach using laser sensor waveguides comprising phase control, gain and grating sections in measuring environmental chemicals (Figure 1) and placing Bragg grating reflector

having different sampled periods in its laser sensor (Figure 1). Such a waveguide would provide a sensor with high sensitivity, compact, low-cost and real-time sensors. (See Abstract and Introduction) Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention wad made to have provided the device with Lading et al. where the sample chamber separate from the laser sensor, with the laser waveguides having phase control section as taught by Beregovski et al., since it is known in the art to have higher sensitivity and lower cost for the detection of analyte in interest.

6. Claims 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lading et al. and Beregovski et al. and further in view of Seul et al. (USP 6387707)

Lading et al. and Beregovski references have been discussed above which fail to recite using dielectrophoretic electrodes. Seul et al. disclose using dielectrophoretic properties of various cells as basis for increase particle concentration and particle separation. (Col. 39, line 19-29) Therefore, it would have been obvious to one skill in the art at the time the invention was made to have provided the modified optical device of Lading et al. with the dielectrophoretic electrode as taught by Seul et al., in order to increase the concentration of molecules to be diagnosed adjacent to the adsorbent of the sample chamber.

Response to Applicant's Arguments

7. Applicants pointed out that Beregovski et al. teach away from the instant invention by *covering* the sensing layer, including phage control section, gating section, with chemicals sensitive to the analytes of interests, whereas applicants' claims all call for a "separate and physically spaced" configuration between sample chamber and the phase control section. Applicant's arguemts have been considered but appears not persuasive because the asserted physically separate and spaced feature of the instant application can be still read on by reference of Lading et al. (See Figure 2-4)

The device of Lading et al has shown that the sample chambers (component (8, 8')) are *separate and physically spaced* from the laser sensor (component (7, 7')). (See Figure 2) Additionally, from the top view, the sample cavities are physically separate and spaced from the gain and mirror regions. (See Figure 3, component 14a-14b as sample cavity versus component 12 gain region and component 11 mirror region). Therefore, the Lading et al. reference has features of pair sensors, heterodyne detectors, and sample chambers are physically separate and spaced from the sensor. The Beregovski et al. reference provides the advantages and suggestions of using phase control section on the sensor. It would be obvious to one skilled in the art to place the phase control region besides gain region where it is distance from the sample cavities as shown in Figure 3 of Lading et al. as taught by Beregovski et al. to have the advantages of having high sensitivity, compact, low-cost and real-time sensors. (page 116, left column, first paragraph)

Conclusion

8. No claim is allowed.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacob Cheu whose telephone number is 703-306-4086. The examiner can normally be reached on 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le can be reached on 703-305-3399. The fax phone number for the organization where this application or proceeding is assigned is 703-746-9434.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3399.

Jacob Cheu
Examiner
Art Unit 1641

LONG V. LE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1600
12/01/03

November 21, 2003